

Claims:

1. A putter-head for imparting a positive rate (S) of topspin on a golf ball for impacts with the ball throughout a range of impact height (h_i) extending above 5 millimetre from the bottom of the putter-head, wherein the head has a centre of mass located at a distance p millimetre behind its impact face and a height h_c millimetre above the bottom of the head, a mass M kilogram and a radius of gyration K millimetre about the heel-toe axis through the centre of mass, and the loft (α) of the impact face increases monotonically with height from 5 to 15 millimetre above the bottom of the putter-head, and wherein:

$$(a) \quad K^2/p > 5$$

and

$$(b) \quad S = S_G + S_L$$

where the spin rates S_G and S_L expressed as percentages, are as follows:

$$S_G = (250 \times h) / [(3.2 + 70 \times M) \times (K^2/p) + p]$$

$$S_L = (-0.76 \times \alpha_i) / [1 + 0.04 \times (p/K)^2]$$

for which:

$$h = h_i - h_c - p \times \sin(\alpha_i)$$

and

α_i degrees is the impact-face loft at height h_i millimetre.

2. A putter-head according to Claim 1 wherein the loft (α_{15}) at 15 millimetre above the bottom of the head is at least 3 degrees larger than the loft (α_5) at 5 millimetre above the bottom of the head.
3. A putter-head according to Claim 2 wherein α_{15} is at least 5 degrees larger than α_5 .
4. A putter-head according to Claim 3 wherein α_{15} is at least 7 degrees larger than α_5 .
5. A putter-head according to any one of Claims 1 to 4 wherein S is at least +2.5%.
6. A putter-head according to Claim 5 wherein S is at least +5.0%.
7. A putter-head according to any one of Claims 1 to 6 wherein the head also imparts a positive rate (S) of topspin of at least 5.0% for impacts with the ball throughout a range of impact height (h_i) extending above 2.5 millimetre from the bottom of the putter-head.
8. A putter-head according to any one of Claims 1 to 7 wherein h_c is less than 10 millimetre.
9. A putter-head according to Claim 8 wherein h_c is not more than 7 millimetre.
10. A putter-head according to any one of Claims 1 to 9 wherein the ratio K^2/p is more than 5 millimetre.
11. A putter-head according to Claim 10 wherein the ratio K^2/p is not less than 8 millimetre.

12. A putter-head according to any one of Claims 1 to 11 wherein p is at least 10 millimetre.
13. A putter-head according to Claim 12 wherein p is less than 35 millimetre.
14. A putter-head according to Claim 13 wherein p is less than 30 millimetre.
15. A putter-head according to any one of Claims 1 to 14 including shaft-attachment means and wherein a putter-shaft is attached to the head via the shaft-attachment means and the horizontal offset of the axis of the shaft from the heel-toe axis is less than the radius of the shaft at the shaft-attachment means.
16. A putter-head according to Claim 15 wherein the shaft-attachment means has zero horizontal offset from the heel-toe axis.
17. A putter-head according to Claim 15 or Claim 16 wherein the horizontal displacement of the shaft-attachment means from the centre of mass is less than the radius of gyration K .
18. A putter-head according to any one Claims 1 to 17 wherein the impact face includes an upper, flat portion having positive loft.
19. A putter-head according to any one of Claims 1 to 18 wherein the impact face includes a lower portion which is curved and has loft that increases from a negative value to a positive value upwardly from the bottom of the head.
20. A putter-head according to any one Claims 1 to 18 wherein the impact face includes a lower, flat portion having negative loft.